

# Intestinal parasitic infections in officers of the Border Guard in East Poland

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## ABSTRACT

**Background:** Poland has experienced increased economic migration since 2021. Large waves of migrants, mostly from Asian and African countries, are trying to get into the European Union by crossing Poland's eastern border illegally. The influx of illegal migrants into Poland is the result of a policy adopted by the Belarusian and Russian regimes that are trying to provoke another migrant crisis in Europe. In the opinion of some Polish politicians illegal migration contributes to the spread of parasitic diseases in our country as many migrants arriving into Poland carry intestinal parasites. The aim of this study was to assess the prevalence of infections with intestinal parasites in the Polish Border Guard officers safeguarding Poland's eastern borders.

**Materials and methods:** Parasitological diagnostics was carried out between April and May 2023. The study involved 218 Polish Border Guard officers from the Podlaski Border Guard Unit (PBGU) and 209 officers from the Bug Border Guard Unit (BBGU), whose task is to patrol and safeguard Poland's border with Ukraine and Belarus. Faecal examinations were performed using three different light microscopy testing methods (direct smear, decantation, flotation) at the Department of Epidemiology and Tropical Medicine at the Military Institute of Medicine – National Research Institute, Warsaw, Poland.

**Results:** Considered to be potentially pathogenic intestinal parasites were diagnosed in 20 out of 218 officers serving in the PBGU (8.7% infected with *Blastocystis* spp., 0.5% with *Dientamoeba fragilis*) and in 9 out of 209 officers serving in the BBGU (3.8% infected with *Blastocystis* spp., 0.5% with *Dientamoeba fragilis*). There were no infections with nematodes, cestodes or trematodes in the study participants. No correlation was found between a parasitic infection and the presence of diarrhoea or other gastrointestinal symptoms within 6 months prior to the study in both groups.

**Conclusions:** Although Polish Border Guard officers deployed to the eastern border are exposed to difficult environmental conditions and have frequent contacts (either directly or indirectly) with migrants arriving from countries which report high incidence of parasitic infections, the rates of infections with potentially pathogenic protozoa in officers from the PBGU and BBGU are low and mainly attributable to pathogens which are widespread in the general Polish population. Low rates of parasitic infections in officers serving in the border zone suggest that the epidemiological situation of parasitic diseases in East Poland is satisfactory and that the disease prevention strategies (including the use of personal protection gear) implemented by the Polish medical services are effective.

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**Keywords:** intestinal parasites, epidemiology, Border Guard, illegal migrants, Poland

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## INTRODUCTION

Mass migration is a natural social reaction to military conflicts, persecution, violence, and poverty. An influx of millions of refugees or asylum seekers into any country offering shelter poses major political, economic, and health-related issues [1]. In recent years many countries, including Poland, experienced increased economic migration. Most economic migrants originate from Asian and African countries. Illegal migration has rapidly increased since 2021 when Belarus started an operation organized by its secret services aimed at trafficking massive numbers of illegal migrants from Asia and Africa into the European Union (EU) via the Polish and Lithuanian borders. The operation was a response to sanctions imposed by the EU on Russia and Belarus [2]. In February 2022, Russia launched a large-scale military operation against Ukraine. Since then, the Russian and Belarusian regimes have been organizing and orchestrating the influx of large numbers of illegal migrants from developing countries into the EU, mainly across the Polish border. The aim of this policy is to provoke another migrant crisis in the EU and destabilize the situation in the region. According to the data from the Polish Border Guard Headquarters, there were more than 5,000 attempts to cross the Polish-Belarusian border illegally in 2022, and more than 16,000 such attempts in the first 6 months of 2023. Although the number of attempted border crossings is constantly growing, the actual number of illegal crossings has decreased in recent months, which was mainly possible thanks to the construction of an electronic barrier fitted with a system of video cameras and motion sensors on the border with Belarus. Immigrants attempting to force the Polish border and enter the EU illegally come from dozens of Asian and African countries. According to the World Health Organization reports many of those countries have a high incidence of infections with intestinal parasites. Some Polish politicians have publicly stated that illegal migrants arriving in Poland are carriers of intestinal parasites and that their presence may contribute to the spread of parasitic diseases in our country. Polish Border Guard officers deployed to safeguard Poland's border with Ukraine and Belarus are often exposed to direct contact with illegal migrants. The aim of this study was to assess the prevalence of infections with intestinal parasites in the Polish Border Guard officers serving in the eastern border zone.

## MATERIALS AND METHODS

Parasitological examinations were carried out between April and May 2023 in a group of 427 Polish border guards from the Podlaski Border Guard Unit (PBGU) and the Bug Border Guard Unit (BBGU). The officers serving in those units are tasked with patrolling and safeguarding Poland's eastern border. Of all study participants, 218 were members of the PBGU, which is composed of border guard units

in Białystok, Bobrowniki, Narewka, Białowieża, Kuznica, Sejny, Augustów, Lipsk, and Krynki. Their area of responsibility covers 351 kilometres of the state border (104 km of the border between Poland and Lithuania and 247 km of the border between Poland and Belarus). The rest of the participants, i.e., 209 officers, served in the BBGU and came from the border guard units in Chelm, Hrubieszów, Horodło, Dorohusk, Wola Uhurska, Terespol, Hrebenne, Ślawatycze, Bohukaly, Lubycza Królewska, Dolhobrody, Chłopiatyn. Their area of responsibility covers 467 km of the Polish state border (171 km of the border between Poland and Belarus and 296 km of the border between Poland and Ukraine) [3].

## LABORATORY PROCEDURES

Each participant was asked to provide 2 stool samples collected at 2–3-day intervals. The samples were fixed with SAF fixative (sodium acetate–acetic acid–formalin) and 70% ethanol. The samples were transported to the Department of Epidemiology and Tropical Medicine at the Military Institute of Medicine – National Research Institute, Warsaw, Poland (in accordance with the regulations for transporting biological material) for parasitological examination by light microscopy methods (direct smear in Lugol's solution, decantation in distilled water, Fülleborn's flotation) [4].

## ETHICAL CONSIDERATIONS

Each participant was required to submit informed written consent to participate in the study and be tested for intestinal parasites by researchers from the Department of Epidemiology and Tropical Medicine at Military Institute of Medicine – National Research Institute in Gdynia, Poland. Participants had to provide their personal details (age, sex, place of residence, place of employment, the name of their Border Guard unit) and were asked about the history of any gastrointestinal symptoms, such as diarrhoea, occurring within 6 months prior to the study. The information clause on personal data processing by the Military Institute of Medicine – National Research Institute, Warsaw, Poland was drawn up pursuant to Article 14 (1) and (2) of the Regulation 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, hereinafter referred to as General Data Protection Regulation (GDPR). The legal basis for the processing of personal data is defined in Article 6 (1) (e) of GDPR, which stipulates that the processing of personal data is necessary to perform a task carried out in the public interest.

## RESULTS

A total of 427 border guards were involved in this study; 218 served in the PBGU and 209 in the BBGU. Intestinal parasites were detected in 29 study participants (6.8%):

20 members of the PBGU and 9 members of the BBGU. All infections were caused by potentially pathogenic protozoa, mostly *Blastocystis* spp. (28 cases). There were 2 cases of *Dientamoeba fragilis* infection and 1 case of a co-infection (*Blastocystis* spp. + *Dientamoeba fragilis*). No infections with nematodes, cestodes or trematodes were found. Statistical analysis demonstrated that infections with protozoa were most often found in border guards living in urban areas and in officers aged 41–50 years old. No correlation was found between the presence of a parasitic infection and the presence of diarrhoea or other gastrointestinal symptoms within 6 months prior to the study (Tables 1, 2).

## DISCUSSION

Low rates of intestinal parasitic infections in officers of the Polish Border Guard safeguarding Poland's borders with Ukraine and Belarus suggest that the epidemiological situation of parasitic diseases is satisfactory in East Poland. Studies by Wasilewska et al. [5] and Żukiewicz et al. [6] which were conducted in North-East Poland (the area of operation of the Podlaski Border Guard unit) more than 10 years ago demonstrated high rates (over 20%) of parasitic infections in the region, mostly with *Ascaris lumbricoides*. In contrast, the present study of 427 Border Guard officers found no cases of ascariasis or other geohelminth infections. Although Border Guard officers are continuously exposed to direct or indirect contact with illegal migrants arriving from Asian or African countries (i.e., countries which report high rates of infectious diseases), the rates of protozoan infections in officers are low and, which should be emphasized, they are mainly caused by pathogens that are widespread in the general Polish population [7]. Low rates of parasitic infections in officers serving in the border zone suggest that the disease prevention strategies (e.g., the use of personal protection gear) implemented by the Polish medical services operating in the region are effective. In this context, it is worth pointing out that according to the reports in international medical journals the rates of parasitic infections in the population of refugees arriving from developing countries have been decreasing over the recent years.

According to Ceccarelli et al. [8], the decreased rates of parasitic infections among refugees may be the effect of mass de-worming campaigns conducted under the auspices of World Health Organization and the improvement in sanitation in most developing countries over the last few decades. A study of over 1000 refugees carried out between 2011 and 2016 in Canada demonstrated that although the rate of parasitic infections in the study group reached 40%, most of the infestations were clinically insignificant [9]. All the identified infections were found to have been caused by *Blastocystis* spp. or *Dientamoeba fragilis* protozoa. Infections with these protozoa are

rarely symptomatic and are considered non-pathogenic by many researchers [10–13]. This fact has been supported by the findings of a study by Eiset et al. [14] who studied the prevalence of parasitic infections in Syrian refugees arriving in Denmark. They found that although the rates of *Blastocystis* spp. infections were high among the examined refugees, there was no correlation between infection and symptoms. The author's own study showed no correlation between gender and the prevalence rates of infections, which is consistent with the findings of Tamasri et al. [15]. The present study found a significant correlation between age and the rates of infections; protozoan infections were most often found in officers aged 41–50 years old, which might be attributable to a long-term, asymptomatic colonization of the gastrointestinal tract [16]. The study also demonstrated that infection rates correlated with the area of deployment. There were significantly more infections in officers serving in the PBGU than in officers serving in the BBGU (9.2% vs. 4.3%). There is a limited number of publications on the prevalence rates of intestinal parasitoses in Poland. This data scarcity is the consequence of the entry into force of the 'Act of 2008 on preventing and combating infections and infectious diseases in humans'. Under this law some infections were removed from the national list of notifiable diseases [17]. Studies conducted during the European migrant crisis showed that the mass influx of migrants and refugees into European countries resulted in an increase in the prevalence of intestinal parasitic infections in the general population in Europe [18]. In this context, it should also be noted that potentially non-pathogenic parasites, such as *Blastocystis* spp. or *Dientamoeba fragilis* may have pathogenic potential [13] and even asymptomatic carriage of parasites requires routine epidemiological surveillance.

## CONCLUSIONS

Although officers from the Polish Border Guard safeguarding the Polish border with Belarus and Ukraine are exposed to difficult environmental conditions and have frequent contacts with migrants (directly or indirectly) arriving from countries which report high prevalence of parasitic infections, the rates of infections with potentially pathogenic protozoa in officers of the Polish Border Guard were found to be low and mainly attributable to pathogens which are widespread in the general Polish population. Low rates of parasitic infections in officers serving on the east border suggest that the epidemiological situation of parasitic diseases in East Poland is satisfactory and that the health promotion and disease prevention strategies (including the use of personal protection gear) implemented by the Polish medical services are effective. However, we need to keep in mind that mass migration is associated with an increased

**Table 1.** Intestinal parasitic infections in officers of the Podlaski Border Guard Unit (n = 218)

Podlaski Border Guard Unit	Gastrointestinal symptoms						Place of residence						Sex						Age												
	Yes			No			Town/City			Village			Female			Male			< 30			31–40			41–50			> 51			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%			
Total	218	100.0	61	28.0	157	72.0	164	75.2	54	24.8	76	34.9	142	65.1	20	9.2	88	40.4	93	42.6	17	7.8									
Positive (+)	20	9.2	4	1.9	16	7.3	13	5.9	7	3.3	5	2.3	15	6.9	0	0.0	11	5.0	8	3.7	1	0.5									
Negative (-)	198	90.8	57	28.8	141	71.2	151	76.3	47	23.7	71	35.9	127	64.1	20	10.1	77	38.9	85	42.9	16	8.1									
<i>Blastocystis</i> spp.	19	8.7	4	1.9	15	6.9	12	5.5	7	3.3	4	1.9	15	6.9	0	0.0	10	4.6	8	3.7	1	0.5									
<i>Dientamoeba fragilis</i>	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0									
<i>Blastocystis</i> spp. + <i>Dientamoeba fragilis</i>	1	0.5	0	0.0	1	0.5	0	0.0	1	0.5	1	0.5	0	0.0	0	0.0	1	0.5	0	0.0	0	0.0									
Nematodes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-								
Cestodes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-								
Trematodes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-								

**Table 2.** Intestinal parasitic infections in officers of the Bug Border Guard Unit (n = 209)

Bug Border Guard Unit	Gastrointestinal symptoms						Place of residence						Sex						Age												
	Yes			No			Town/City			Village			Female			Male			< 30			31–40			41–50			> 51			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%			
Total	209	100.0	46	22.0	163	78.0	133	63.6	76	36.4	75	35.9	134	64.1	9	4.3	72	34.4	101	48.3	27	13.0									
Positive (+)	9	4.3	1	0.5	8	3.8	7	3.3	2	1.0	4	1.9	5	2.4	0	0.0	0	0.0	9	4.3	0	0.0									
Negative (-)	200	95.7	45	22.5	155	73.2	126	63.0	74	37.0	71	35.5	129	64.5	9	4.5	72	36.0	92	46.0	27	13.5									
<i>Blastocystis</i> spp.	8	3.8	1	0.5	7	3.3	6	2.8	2	1.0	4	1.9	4	1.9	0	0.0	0	0.0	8	3.8	0	0.0									
<i>Dientamoeba fragilis</i>	1	0.5	0	0.0	1	0.5	1	0.5	0	0.0	0	0.0	1	0.5	0	0.0	0	0.0	1	0.5	0	0.0									
Nematodes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-								
Cestodes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-								
Trematodes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-								

risk of transmission of infectious diseases, including parasitic diseases, therefore it is justified to conduct regular screening for intestinal parasites in officers of the Polish Border Guard safeguarding the Polish borders.

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**Conflict of interest:** None declared

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